



Skills/Proficiencies for 36 Common SAE Programs

Following is a listing of skills/proficiencies for 36 common SAE categories based on the National FFA proficiency award list. The listing under each area is designed to help all parties involved understand *some* of the competencies required for specific project areas so that realistic expectations and goals can be achieved through an SAE. If the SAE category you are looking for is not on this list, keep in mind that many of the skills/proficiencies are applicable to other areas.

E=ENTREPRENEURSHIP

P=PLACEMENT

1. AGRICULTURAL COMMUNICATIONS - E/P

- Be able to write a news article or press release suitable for use by a media outlet.
- Possess strong written and oral communications skills.
- Keep accurate records of special event/project planning and coordination.
- Establish and maintain databases of contact information, activities, donors, etc.
- Possess strong computer skills and a basic understanding of website and graphic design.
- Develop effective editing skills required for written communications such as newsletters and articles.
- Be able to give presentations to service groups, business organizations, donors and others.

2. AGRICULTURAL MECHANICS DESIGN & FABRICATION - E/P

- Learn to operate and maintain power equipment as well as hand tools.
- Become safety certified on all shop equipment and wear proper safety attire.
- Learn about working with different metals and know their properties.
- Understand and maintain a shop inventory.
- Develop welding and metal cutting skills.
- Be skilled in reading blueprints and measuring equipment.
- Understand how to field test equipment.

3. AGRICULTURAL MECHANICS ENERGY SYSTEMS - E/P

- Learn how to install a wire harness.
- Understand hydraulic principles and be able to replace hydraulic hoses on tractors/equipment.
- Be able to wire two and three way switches.
- Be able to install a fuse box, switch box, electrical panel, etc.
- Be able to read amp meters and use electrical testers.
- Implement safety practices in all areas of electrical and hydraulic work.
- Know wire sizes for each job and understand the electrical load for wire types and sizes.

4. AGRICULTURAL REPAIR AND MAINTENANCE - E/P

- Learn to operate and maintain shop power equipment as well as hand tools.
- Be skilled in reading blue prints and measuring equipment.
- Become safety certified on all shop equipment and wear proper safety attire.
- Gain knowledge of small and large engine components.
- Possess skills in welding, metal cutting, engine diagnosing, etc.
- Know how to field test farm equipment.
- Be proficient in maintenance procedures (change oil, rotate tires, check transmission, etc.).

5. AGRICULTURAL SALES - E/P

- Understand promotion of the business (displays, flyers, signs, advertising).
- Build relationships with customers; work on ability to listen and explain.
- Possess strong written and oral communication skills.
- Have knowledge of the business and products as well as machinery used in the business.
- Understand and use product pricing, product manuals, invoicing, bills of lading, etc.
- Keep good records (net worth statements, balance sheets, depreciation schedules, cash flow, etc.).
- Learn about handling money, banking and making business investments.

6. AGRICULTURAL SERVICES - E/P (2 examples)

A. COMMERCIAL HEIFER RAISING - P

- Prepare customer contracts for farmers served; practice good customer relations.
- Implement veterinary practices on all heifer calves (dehorn, give vaccinations, treat lice/mange, etc.)
- Develop calf identification techniques and effective heifer management.
- Use techniques such as calf hutches to lessen disease and sickness.
- Learn how to cost-effectively purchase supplies; bulk purchasing, veterinary discounts, etc.
- Learn sire selection for breeding heifers as well as artificial insemination.
- Implement proactive grazing techniques (rotational grazing, measure and layout grazing fields).

B. MANURE HANDLING BUSINESS – E

- Prepare and sign customer contracts; practice good customer relations.
- Understand manure fertilizer values and overhead cost per gallon to pump manure.
- Prepare a balance sheet, net worth information, cash flow projections, invoices, tax information, etc.
- Develop and update a business plan and keep good records.
- Prepare work site scheduling – equipment for each job, employees for each job.
- Maintain an inventory of supplies and learn about cost-effective supply purchasing.
- Understand the manure handling regulations in your state and implement safety practices.

7. AQUACULTURE - E/P

- Be able to take pH readings from streams and in aquaculture tanks.
- Learn to take measurements for nitrate concentration, oxygen content, turbidity and water speed.
- ¶ Recognize fish and aquatic plants and their contribution to the water ecosystem.
- ¶ Know the life cycle of aquatic animals.
- ¶ Know how to mix and feed fish rations.
- ¶ Figure rates of gain for fish and feed efficiency.
- ¶ Be able to set up and/or design an aquaculture system

8. BEEF PRODUCTION - E/P

- ¶ Learn about effective feeding techniques, how to mix rations, etc.
- ¶ Understand rate of gain and feed conversions.
- ¶ Understand cattle contracting and sales.
- ¶ Possess basic veterinary skills for vaccinations, castration, hoof work, etc.

- ¶ Learn to select quality breeding stock for the herd (bulls and replacement heifers/cows).
- ¶ Understand technologies such as artificial insemination and embryo transplant.
- ¶ Keep accurate herd and financial records.

9. DAIRY PRODUCTION - E/P

- ¶ Know how to read and interpret product records and take milk samples.
- ¶ Understand how to utilize records to select heifer replacements.
- ¶ Understand feeding and using TMR's in the herd feeding program.
- ¶ Learn milking procedures and sanitation in the milk house during milking.
- ¶ Apply veterinary skills for giving vaccinations, treating mastitis, shots, etc.
- ¶ Understand sire selection and genetic mating skills to improve production and type.
- ¶ Understand milk contracting and marketing.

10. DIVERSIFIED AGRICULTURE PRODUCTION - E/P

- ¶ Combine the skills/proficiencies of at least one crop commodity and at least one livestock commodity.

11. DIVERSIFIED CROP PRODUCTION - E/P

- ¶ Combine the skills/proficiencies of two or more crops such as grain, forages, fiber/oil crops, specialty crops, fruits and vegetables.

12. DIVERSIFIED HORTICULTURE - E/P

- ¶ Know how to take soil samples, plant and prune nursery crops, pot flowers, etc.
- ¶ Understand use of fungicides as protectants or eradicates.
- ¶ Learn lawn care: mowing techniques, fertilizing, selecting grass seed, establishing lawns, etc.
- ¶ Be able to identify nursery, lawn and flower species.
- ¶ Understand selection of plants and landscaping materials for different jobs.
- ¶ Be able to identify and treat disease and insect problems in plants, flowers, lawns, etc.
- ¶ Understand nursery operation from answering phones to bagging seed and plant propagation.

13. DIVERSIFIED LIVESTOCK PRODUCTION - E/P

- ¶ Combine the skills/proficiencies of two or more livestock areas such as beef, sheep, swine, dairy and poultry.

14. ENVIRONMENTAL SCIENCE AND NATURAL RESOURCES MANAGEMENT - E/P

- ¶ Plant native wildlife vegetation to increase habitat for wildlife species in your area.
- ¶ Know how to test water to determine oxygen content, pH, nitrate contents, etc.
- ¶ Be able to identify wildlife and plant species in your area as well as wildlife tracks.
- ¶ Create a long range plan for improving an area and meet with a related professional to discuss plan.
- ¶ Know how to measure land to determine acreage and use a transit for reading elevations.
- ¶ Make brush piles for wildlife habitat and plant wildlife food plots.
- ¶ Learn to operate land shaping equipment such as a tractor and blade, bulldozer, etc.

15. EQUINE SCIENCE - E/P

- ¶ Understand and implement grooming, feeding, feet and leg care.
- ¶ Learn riding skills, showmanship and equine safety.
- ¶ Learn how to identify, use and take care of all tack items (includes repair/oiling/inventory).
- ¶ Understand and apply basic veterinary practices and maintain a medical inventory/log.
- ¶ Assist with foaling as well as selection of mares or stallions in the breeding program.
- ¶ Understand horse registration and join associations as required.

- ¶ Learn how to exercise and train horses, and prepare horses for competition.

16. EMERGING AGRICULTURE TECHNOLOGY-E/P

- ¶ Have broad knowledge of computer technology (databases, spreadsheets, publishing software).
- ¶ Be able to use the Internet for sales or advertising.
- ¶ Work in a laboratory situation doing soil testing, milk testing, biotechnology research, etc.
- ¶ Be able to set up a laboratory for personal or class use.
- ¶ Follow laboratory protocol and understand how to use microscopes and other equipment.
- ¶ Build laboratory systems for alcohol synthesis, to separate chemicals, research hybrids, etc.
- ¶ Use GPS in agriculture for fertilizer application, mapping fields, scanning market animals, etc.

17. FIBER AND/OR OIL CROP PRODUCTION - E/P (2 examples)

A. PEPPERMINT/SPEARMINT OIL PRODUCTION – E/P

- ¶ Understand field tillage operations and soil sampling.
- ¶ Be able to identify disease and insects (become pesticide certified to treat problems).
- ¶ Gain knowledge of soil types for growing peppermint/spearmint and their properties.
- ¶ Learn business operations; cutting and raking mint, chopping mint plants, distilling oil, etc.
- ¶ Understand contracting, customer relations and marketing.
- ¶ Improve production by growing multiple crops in one year, using better irrigation techniques, etc.
- ¶ Learn how to maintain and fabricate specialized equipment.

B. SOYBEAN PRODUCTION – E/P

- ¶ Understand field tillage operations.
- ¶ Be able to sample soils and read results.
- ¶ Be able to identify disease and insects (become pesticide certified to treat problems).
- ¶ Learn business operations; combining the crop, drying the crop, crop storage, etc.
- ¶ Understand crop rotation and variety selection as well as use of round-up ready varieties.
- ¶ Use marketing techniques: direct sales and contracting.
- ¶ Know how to repair and maintain production/harvest equipment.

18. FLORICULTURE - E/P

- ¶ Learn basic floral care; watering, feeding, refrigeration/storage.
- ¶ Know how to cut and arrange flowers.
- ¶ Be able to identify flowers and determine how they fit into a display or arrangement.
- ¶ Be able to grow a flower crop using associated skills (soil testing, pest control, cut times, tillage, etc.)
- ¶ Learn how to dry flowers and use dried flowers in arrangements.
- ¶ Develop sales/marketing techniques and customer service skills.
- ¶ Learn how to take floral orders, make deliveries, operate the cash register, etc.

19. FORAGE PRODUCTION - E/P

- ¶ Know harvesting methods (baling, chopping, silage, grazing, etc.).
- ¶ Know the proper harvest moisture for silage (alfalfa, corn, soybeans, etc.).
- ¶ Learn how to figure storage capacity in trench silos, upright silos, hay mow storage, etc.
- ¶ Use forage testing to determine the relative feed value for hay or silage.
- ¶ Establish a long range field plan for planting, harvesting, crop rotation, etc.
- ¶ Be able to identify diseases and insects and apply pesticides as needed (obtain pesticide license).
- ¶ Understand tillage operations, soil testing, variety selection.

20. FOOD SCIENCE AND TECHNOLOGY - E/P

- ¶ Follow laboratory protocols and wear proper safety attire.
- ¶ Know how to conduct experiments (research food preservation, product flavoring, growth additives).

- ¶ Know how to analyze components or the make-up of food products.
- ¶ Learn how to conduct product testing (How to test milk for solids, fat, protein and water content.).
- ¶ Understand and implement data comparison (new varieties versus older varieties; antibiotic comparisons).
- ¶ Determine digestibility of certain foods.

21. FOREST MANAGEMENT AND PRODUCTS - E/P

- ¶ Know how to maintain and repair equipment in the harvest and processing of lumber.
- ¶ Understand equipment operation and safety.
- ¶ Be able to estimate the amount of lumber in a stand of trees.
- ¶ Be able to recognize different wood types and know their properties.
- ¶ Understand how to “fall a tree” as well as cutting techniques (block cutting).
- ¶ Know how to plant and care for new trees for reforestation.
- ¶ Know how to effectively dispose of all branches and stumpage.

22. FRUIT PRODUCTION - E/P

- ¶ Possess knowledge of laying out the garden/field/orchard.
- ¶ Obtain a pesticide application license and know how to apply pesticides.
- ¶ Understand tillage and weed control as well as tree care (pruning, watering, fertilizing, etc.)
- ¶ Understand harvesting, packaging, sales preparation, delivery methods, etc.
- ¶ Employ a marketing strategy (roadside stands, delivering to groceries, wholesale contracts).
- ¶ Know how to establish new plantings or trees (variety selection).
- ¶ Recognize and treat disease and insect problems.

23. GRAIN PRODUCTION - E/P

- ¶ Understand the use of no-till versus conventional tillage methods and the results.
- ¶ Know how to conduct soil and moisture testing and read the results.
- ¶ Know how to measure grain yields.
- ¶ Be able to identify and treat disease and insect infestation (obtain license to apply pesticides).
- ¶ Obtain your commercial driving license (CDL) to haul grain to market.
- ¶ Know how to safely operate harvesting equipment, equipment at the grain storage facility, etc.
- ¶ Understand the use of genetically modified seeds and the benefits.

24. HOME AND/OR COMMUNITY DEVELOPMENT - E/P

- ¶ Be able to map and identify community resources to help with improvement projects.
- ¶ Take an inventory of community and home improvement areas and develop an improvement plan.
- ¶ Assist the community in times of disaster (floods, fires, snow damage, tornado, other storm clean-up).
- ¶ Learn improvement skills such as painting, woodwork, flooring, etc.
- ¶ Build community flower beds or flower containers for businesses, home or community landscaping.
- ¶ Organize and lead a team to assist people in need of services they cannot do themselves.
- ¶ Volunteer/assist with building park benches, playground equipment, horse shoe pits, etc.

25. LANDSCAPE MANAGEMENT - E/P

- ¶ Be able to identify different varieties of plants and trees.
- ¶ Understand the characteristics of plants selected for a landscape project.
- ¶ Know how to safely operate and maintain landscaping equipment.
- ¶ Learn how to use computer-assisted landscape drafting programs.
- ¶ Learn how to select landscape materials other than plants (timbers, bricks, a trellis, etc.).
- ¶ Know how to figure a bill of materials and prepare an estimate for a landscape job.
- ¶ Be able to read the plat books/soil survey books to ensure the property is accurately laid out.

26. NURSERY PRODUCTION - E/P

- ¶ Be able to identify and tag common nursery stock.
- ¶ Know how to care for nursery stock before and after it is harvested.
- ¶ Implement pruning techniques for developing saleable nursery stock.
- ¶ Have knowledge of irrigation, propagation of perennials, fertilizers, etc.
- ¶ Be able to identify disease and insects and treat problems (obtain pesticide certification license).
- ¶ Assist with sales in the nursery plant yard and help customers select and care for nursery stock.
- ¶ Know how to operate and maintain nursery equipment.

27. OUTDOOR RECREATION - E/P (two examples)

A. POOL WORKER – P

- ¶ Keep an inventory of pool supplies and know how to operate pool equipment.
- ¶ Teach swimming lessons (different swimming strokes, how to float, life saving).
- ¶ Know how to sample water for pH, chlorine content, bacteria content, etc.
- ¶ Learn administrative skills (collect and record fees, post rules, pool opening/closing).
- ¶ Coordinate pool functions and swimming activities.
- ¶ Obtain life guard certification (Level I, Level II); learn First Aid and CPR.

B. CAMPGROUND DIRECTOR/YOUTH COUNSELOR – P

- ¶ Learn how to teach a variety of summer and winter activities (sports, horseback riding, knot tying, etc.).
- ¶ Understand campground maintenance and safety procedures/practices (learn First Aid and CPR).
- ¶ Serve as an activities director; provide team leadership, teach safety, enforce rules, etc.
- ¶ Be able to identify plants and animals, build a campfire, identify potential problems, etc.
- ¶ Understand the administration of running camp (open/close camp areas, stables, pool, boat house, etc.).
- ¶ Maintain attendance and participation records as well as parental consent forms, health forms, etc.

28. POULTRY PRODUCTION - E/P

- ¶ Be able to identify and treat diseases and pest problems.
- ¶ Understand poultry health issues, preventative measures and treatments.
- ¶ Know how to feed different poultry types (meat animals, laying animals).
- ¶ Understand breed selection and housing of different types of poultry.
- ¶ Know how to do feed conversions and ration formulations.
- ¶ Keep egg production records for laying animals.
- ¶ Learn about home slaughter, commercial marketing and processing for meat animals.

29. SHEEP PRODUCTION - E/P

- ¶ Be able to identify breeds and characteristics of breeds in your flock.
- ¶ Learn about ram and ewe selection as well as crossbreeding programs to improve lamb performance.
- ¶ Know how to figure rate of gain, feed conversion rates, balance rations for market and breeding animals.
- ¶ Understand marketing methods for market lambs, breeding stock and show lambs.
- ¶ Know how to shear sheep and market wool as a value-added product.
- ¶ Track carcass performance of fair animals to help improve production and feeding practices.
- ¶ Learn how to identify animals and use marking methods such as tags or ear marks.

30. SMALL ANIMAL PRODUCTION AND CARE - E/P

- ¶ Be able to identify breeds of small animals and know their characteristics.

- ¶ Learn to give basic shots and vaccinations; assist at a veterinary clinic with care and procedures.
- ¶ Know grooming and pet care (trim dog nails, pet exercise, obedience training, sanitation practices, etc.)
- ¶ Be able to identify animal parasites and recommend/perform treatment.
- ¶ Become skilled in lab work areas such as autopsies for diseased animals, packaging samples for the lab, etc.
- ¶ Handle inventory items for the pet store or clinic where you work (price items, stock shelves).
- ¶ Keep good records of pet vaccinations, health issues, contact information, etc.

31. SPECIALITY ANIMAL PRODUCTION - E/P (1 example)

A. RAISING ELK – E

- ¶ Understand bull and cow breeding stock selection as well as selecting calves for herd replacement.
- ¶ Know what to feed animals and how to mix rations.
- ¶ Know how to build fences, taking into consideration height and double fencing to prevent outside contact.
- ¶ Take safety precautions when working with elk (bull temperament, aggressive cows with calves).
- ¶ Learn tagging and identification of elk calves as well as how to take hair samples for DNA verification.
- ¶ Understand the rules and regulations for raising elk and keep good records in all areas of the operation.
- ¶ Learn about value-added activities such as antler harvest (handling velvet, storing velvet, marketing).

32. SPECIALTY CROP PRODUCTION - E/P (1 example)

A. SEED PRODUCTION - P

- ¶ Know how to plant test plots and keep varieties separated by identity.
- ¶ Establish a uniform population for varieties so replicated tests are based on uniform populations.
- ¶ Be able to inoculate inbreds for tolerance to problems (smut, stalk rot, etc.).
- ¶ Know how to record data on stalk and root lodging, yield, insect damage, disease infestations, etc.
- ¶ Know how to operate/maintain harvesting equipment.
 - Know how to bag, tag and store seed.
 - Be able to harvest a plot (soybeans, alfalfa, clover, corn, etc.).

33. SWINE PRODUCTION - E/P

- Know and use basic veterinary skills (clipping needle teeth, castration, vaccination, clipping tails, etc.).
- Understand boar and gilt selection and breeding systems such as rotational crossing.
- Know how to mix rations to feed different age groups of swine; understand feed efficiency and rates of gain.
- Learn identification methods such as ear notching.
- Know how to contract sales of market hogs and other marketing methods.
- Apply improvement practices such as artificial insemination.
- Learn showmanship skills to enhance sale of breeding or market swine.

34. TURF GRASS MANAGEMENT- E/P

- Have knowledge of grass seed varieties and be able to select the right variety for different lawns.
- Be able to use different lawn mowing techniques.
- Be able to conduct soil testing and read/interpret test results to make recommendations.
- Know how to safely use and care for equipment/tools (edger, leaf blower, aerator, lawn mower, etc.).
- Recognize and be able to treat disease and insect problems in lawns.
- Know how to efficiently dispose of lawn clippings (bagged and removed or mulched).

- Practice good customer relations and record keeping.

35. VEGETABLE PRODUCTION - E/P

- Learn about variety selection and selecting varieties that grow well in your area.
- Be able to identify diseases and insects and provide treatment (obtain pesticide license).
- Know how to safely and effectively use and care for equipment used in production and harvest.
- Understand how to lay out the garden or fields where vegetables are grown.
- Understand the value of tillage, weed control and use of mulches.
- Know how to cost-effectively harvest vegetables and prepare them for market.
- Know how to market the crop using direct markets, roadside stands or contracting.

36. WILDLIFE MANAGEMENT - E/P

- Be able to conduct a wild game census.
- Know how to identify wildlife species and wildlife signs (tracks, deer rubs, nesting areas, bedding areas, etc.).
- Learn wildlife characteristics (nocturnal or diurnal, mating habits, food requirements, etc.).
- Utilize animal population control methods (hunting, trapping, stocking pheasants, quail, turkeys, etc.).
- Be able to identify plant species in the area and know how to plant wildlife shrubs, trees, etc.
- Have knowledge of local and state hunting rules and regulations as well as firearm and archery safety.
- Know how to establish wildlife food plots and feed young raised wildlife (pheasants, quail).

